ENERGY STAR® Office, Bank/Financial Institution, and Courthouse Energy Performance Scale Development

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Adjustments of Ratings Models to Account for Extreme Values (Nov 23, 2009) .....(pg#?)

A report assessing the sensitivity of models to extreme values for characteristics used. The bias of models towards large buildings was examined, specifically that models were giving disproportionately higher scores to buildings with extreme values for characteristics (higher worker or PC density, for instance). A solution proposed involved putting caps on values for each characteristic, above which a building would not get additional increase predicted EUI. The sensitivity analysis shows the the extent to which buildings with large values distort the overall percentile ranking of the energy performance scale and how much improvement caps at different values offer. A final recommendation is given along with a timeline for further development before the model release date.

Office and Retail Model Adjustments, Direction for SRA (Dec 11, 2009) .....(pg#?)

A document explaining the adjustments required for Office and Retail models to correct for bias in favor of retail buildings with extremely high register density and office buildings with excessive indoor space or pc density. This document details how this bias was corrected by simply capping the values for these characteristics; the square footage adjustment for office buildings total indoor space would be capped at 200,000 square feet, beyond which no adjustments would be made to the building. The PC and register density at offices and retail stores would be capped as well at 11.1 and .71, respectively. The document also provided a timeline of implementing these changes before the public release of the updated models on April 2010.

Final Office Model Replication .....(pg#?)

A document that provides all information necessary to replicate the Office energy performance scale model. Among the information provided are descriptive statistics summarizing CBECS survey data for characteristics selected as variables in the statistical regression upon which the model is based. The filters applied to this survey data to form the dataset used in the regression are explained in detail. The model resulting from this regression and the development of the score lookup table are provided as well. The goodness-of-fit of this model is also discussed by providing descriptive statistics of how much variation is accounted for, such as the R^2 value and ANOVA tests.

Analysis of Expected Changes, June 2010 Portfolio Manager Release .....(pg#?)

An internal report assessing the overall score changes caused by updates to numerous energy performance scales, including Office, Bank/Financial Institution and Courthouses. Aggregate statistics measuring the changes to building scores are presented, such as average score change across all buildings, average score change by category, total number of buildings losing/gaining the ENERGY STAR, etc. The technical changes to each model (upon which the energy performance scales are based) is summarized for each type of building. Examples of these technical changes include the usage of more recent CBECS data and the alteration of indoor space limitations. An appendix with further statistics and relevant information is included.

Final Lookup Table .....(pg#?)

An excel file that was used to create the final lookup table. This spreadsheet contains all the information from CBECS data of 498 offices, banks/financial institutions and courthouses required to recreate the energy performance scale. All requisite variables for scoring each building are available such as seating density, heating degree days, pc density, hours of operation, etc. Also shown are the results of a weighted regression using all variables, with coefficients for each variable are shown. The predicted EUI and energy efficiency ratios for each building are then determined and used to create a table listing the score and percentile corresponding to each building also included.

ENERGY STAR® Performance Ratings Technical Methodology for Office, Bank/Financial Institution, and Courthouse .....(pg#?)

The final draft of the Technical Methodology for Office, Bank/Financial Institution and Courthouse energy performance scale. The document explains how this model was developed and how the score based upon it can be systematically applied to any eligible building. This document is publicly available on the website and walks readers through each aspect of development. The explanation provided proceeds in an orderly manner, beginning with the reference data for hospitality facilities from the CBECS survey, the characteristics/variables selected from the survey, the filters applied to those variables, the statistical regression of the final dataset, the development of coefficients from the results of this regression, the predicted EUI formula upon which the model is based on and, finally, an example calculation. This example calculation walks readers through utilization of the model by calculating a predicted EUI based on the example facility's data, calculating actual EUI and assigning a score based on the energy efficiency ratio of the actual EUI over the predicted EUI. The final score lookup table is also given at the end of the document.

Note: The file names for the documents in the shared folder on the G drive are different than the titles listed above. The list below shows which file names correspond to which title above:

Title in Table of Contents	File Name on Shared Drive
Presentation, Updates to the EPA Rating for Office Space	20061108_Offices
Model Revision Phase 1, Direction for SRA	P1_Direction_Updated_20070614
Analysis of Overall Rating Changes	2007_September Aggregate_Changes
Detailed Analysis of Office & Data Center Changes Associated with 2010 Portfolio Manager Release	Detailed Analysis for CRE 20100614
Adjustments of Ratings Models to Account for Extreme Values	Model Sensitivity_20091123
Office and Retail Model Adjustments, Direction for SRA	Direction_Office and Retail_20091211
Final Office Model Replication	Office_Model_Final
Analysis of Expected Changes, June 2010 Portfolio Manager Release	Overall Summary for Branch 2010604_Final
Final Lookup Table	Final_Lookup_498
ENERGY STAR® Performance Ratings Technical Methodology for Office, Bank/Financial Institution, and Courthouse	Office_TD_20100607_posted

Shared Folder Location:

G:\CPPD\C&I Branch\C&I Tools Team\ENERGY STAR Scale – Referenc\Office